

Notice of Allowability

Application No.

10/025,780

Examiner

Sonny TRINH

Applicant(s)

PARK ET AL

Art Unit

2687

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to response to election/restriction filed 09/26/05.
2. ☒ The allowed claim(s) is/are 1-4,6-8 and 11.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Election/Restrictions

1. This application is in condition for allowance except for the presence of claims 5, 9-10, and 12, directed to non-elected invention without traverse. Accordingly, claims 5, 9-10, and 12 have been cancelled.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In the claims:

Please cancel claims 5, 9-10, and 12;

This Examiner's amendment was necessary to cancel the non elected claims.

(End of Examiner's Amendment)

Allowable Subject Matter

3. Claims 1-4, 6-8, and 11 are allowed.

The following is an examiner's statement of reasons for allowance:

The present invention relates to an apparatus for forward beamforming using a feedback of multipath information and a method thereof; and, more particularly, to an apparatus for forward beamforming using a feedback of multipath information, which is used in a frequency division duplex (FDD) code division multiple access (CDMA) base station system that uses an array antenna, and a method thereof. The base station estimates an angle of arrival (AOA) range of a user signal from reverse link received data and calculates a plurality of beamforming weights steering the estimated AOA range. Then, the base station transmits a user pilot signal by sequentially using the plurality of beamforming weights at different time areas through a control channel to estimate a forward channel conditions. A terminal calculates the user pilot signal power for all fingers at the respective time areas and feeds a time area number corresponding to the greatest power back to the base station. The base station transmits a data channel signal using a beamforming weight corresponding to the time area number fed back from the terminal.

The instant application is directed to an non-obvious improvement over the invention described in Pat. No. 5,634,199 to Gerlach et al. The improvement comprises an arrival angle range estimation means for estimating an angle of arrival (AOA) range

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of a user signal from a reverse link received data and generating an estimated AOA range; an array receiver and demodulation means for spatial-filtering a data received through the array antenna and demodulating a data fed back from a terminal; a forward beamforming weight control means for calculating a plurality of transmission beamforming weights steering the estimated AOA range and selecting one beamforming weight steering a direction with a best forward channel condition for data channel transmission using the feedback data; and a forward beamforming and modulation means for transmitting the data channel signal using the selected beamforming weight and transmitting a user pilot signal by sequentially using the plurality of the transmission beamforming weights at different time areas.

Claims 2-4 are allowed by virtue of their dependency on claim 1.

Claims 6 and 11 are the corresponding method claim and computer program necessary for the system as specified in claim 1 and are therefore allowed.

Claims 7-8 are allowed by virtue of their dependency on claim 6.

Conclusion

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sonny TRINH whose telephone number is 571-272-7927. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester KINCAID can be reached on 571-272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

11/29/05


SONNY TRINH
PRIMARY EXAMINER